

Programme	B. Sc. (CA & IT) Honours				Branch	Computer Applications			
Semester	V				Version	1.0.0.0			
Effective from Academic Year			2026-27		Effective for the batch Admitted in			June 2024	
Subject code	U15B4CN		Subject Name		COMPUTER NETWORKS				
Teaching scheme					Examination scheme(Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CCE	SEE	Total
	L	TU	P	TW					
Credit	4	-	-	-	4	Theory	50	50	100
Hours	4	-	-	-	4				

Objective:

To learn key concepts of computer networking, focusing on protocols, routing, transport services, and security.

Pre-requisites:

Basic understanding of computer systems and digital fundamentals.

Learning Outcome:

Name of CO	Description
CO1	To describe network fundamentals and protocol models.
CO2	To explain physical and data link layer functions.
CO3	To analyze IP addressing and routing protocols.
CO4	To understand transport and application protocols.
CO5	To identify basic network security concepts.

Mapping of CO and PO:

COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	3	2	1	1	2	2	1	1
CO2	3	3	3	2	3	2	2	1	2	2	2	1
CO3	3	3	3	3	3	2	2	2	3	2	2	2
CO4	3	2	3	3	2	2	2	1	2	2	2	1
CO5	2	2	3	2	3	3	3	2	3	3	2	2

Content:

Unit	Content	Hrs.
1	Fundamentals of Computer Networks and Protocol Architectures: Introduction to computer networks, Uses of computer networks, Types of Networks, Network Topologies, Network Devices, IEEE Standards, Introduction to OSI model, TCP/IP protocol suite, Comparison of OSI and TCP/IP models, Transmission modes, Switching Techniques (Circuit Switching, Packet Switching, Message Switching).	12
2	Physical Layer and Data Link Layer Protocols: Transmission Media (Guided and Unguided), Error detection, Error Correction, Framing Methods, Flow Control Techniques (Stop & Wait, Sliding Window), Medium Access Control (ALOHA, CSMA/CD, CSMA/CA), Ethernet (IEEE 802.3), Wireless LAN (IEEE 802.11 Architecture and Features), Protocols (HDLC, PPP).	12
3	Network Layer-Functions, IP Addressing, and Routing Protocols: Functions of Network Layer, IPv4 addressing, Subnetting, Supernetting, IP packet structure, Classful vs Classless addressing, VLSM, Routing algorithms, Routing protocols (RIP, OSPF, BGP), ICMP, Address Resolution Protocol (ARP) and Reverse ARP, DHCP, IPv6 addressing	12

4	Transport and Application Layer Protocols: Role of the transport layer, Comparison of TCP vs UDP, TCP operations, UDP operations, Multiplexing and Demultiplexing, Domain Name System (Structure and resolution), HTTP protocol, FTP Protocol, Email Protocols (SMTP, POP3, IMAP), SNMP.	12
5	Network Security Essentials: Introduction to Network Security (Confidentiality, Integrity, Availability), Cryptography, SSL/TLS and HTTPS protocols, VPNs, Firewalls, IDS, and IPS, Common Network Attacks, Wireless security, Secure Remote Access.	12
Practical Content:		
Reference Books:		
1	The "Data Communications and Networking" by Behrouz A. Forouzan, 4th edition, published in 2007.	
2	TCP/IP Protocol Suite by Behrouz A. Forouzan, 4th Edition, McGraw-Hill Education, 2010.	
3	Computer Networks by Andrew S. Tanenbaum, 5th Edition, Pearson, 2010	
Web Reference:		
1	www.onlinecourses.nptel.ac.in/noc20_cs23/preview	
2	www.classcentral.com/course/swayam-introduction-to-computer-networks-and-internet-protocols	
3	www.archive.nptel.ac.in/content/storage2/courses/106105080/pdf/M1L1.pdf	
4	www.netacad.com/cisco-packet-tracer	
MOOC/Certificate Course:		
1	www.nptel.ac.in/courses/106105081/	
2	www.onlinecourses.swayam2.ac.in/ntr25_ed100/preview	
3	www.netacad.com/courses/networking-basics?courseLang=en-US	
Question Paper Scheme:		
	<p>End Semester Examination Duration: (2 Hours Theory Examination)</p> <p>Note for Examiner: - Q-1 Any Five out of Seven (25 Marks) Q-2 Any Two out of Three (06 Marks) Q-3 Mandatory question (05 Marks) Q-4 Any Two out of Three (08 Marks) Q-5 Any Two out of Three (06 Marks)</p> <p>*The question paper must comprehensively address all Course Outcomes (COs), align with Bloom's Taxonomy levels, and ensure complete syllabus coverage.</p>	